

AVIATION

The Oldest American Aeronautical Magazine

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Flight picture of a Wright Whirlwind Powered Stearman Biplane.

VOLUME
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NUMBER
3

Special Features

Italy to Brazil
With the National Air Tour
Airport Runway and Surface Treatments

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Room for twelve ... and their baggage

Does it seem fanciful to suggest that transport operators will soon planes capable of carrying twelve passengers and their baggage? Does it seem utterly planes of this capacity can be filled? Listen to Mr. W. Irving Glover, Assistant Postmaster General, addressing the New York Traffic Club:

"How much larger ... before anyone is going to establish a passenger line to take the travel-hungry passenger from the Pacific Slope all the way to the Twin Cities and deposit him with speed and safety at either Detroit or Cleveland?"

"How much larger is the business now going to be handled with just one method of travel, by mail, to that great city, St. Louis, from New York?"

"How much longer is the third business man going to be satisfied with spending twelve or sixteen hours of his week-end getting to the Motor Club room?"

"Think it over, I say, how much longer is the condition going to exist? Not long, for the demands of the American traveling public will bring this new method of traveling into being."

And already the press announces the early, almost immediate fulfillment of one of Mr. Glover's prophecies.

So still is aviation progress that it is fully to plan only for the needs known to exist right now—tomorrow they may be doubled. Twelve passengers! Does that seem too many? Year after next quite likely you'll be wondering how you ever got along with planes that carried fewer.

THE STOUT METAL AIRPLANE COMPANY
Division of
FORD MOTOR COMPANY
Dearborn, Michigan



The Oldest American Aeronautical Magazine

Vol. XXV

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No. 3

Italy's Achievement

THE BREAKING of the world endurance record and the extraordinary flight from Rome to North America by the Italians, Capt. Arturo Ferrarin and Maj. Giulio P. Delprino, is even more significant than is evident at first sight. The Savoia Marchetti plane is far from an orthodox design; in fact, it is almost a revolutionary departure from present day practice. There is no fuselage, the cockpit wing containing the gasoline tanks and the rear a quarters requiring only a slight detour from a wing. The tail supported by booms, the lower members of which are flexibly streamlined into a bumper for the wheels. The plane is the nearest approach to a successful "flying wing" which has yet been made. The power plant is of the pusher type, with the engine set about the axis in a beautifully streamlined nacelle, an arrangement which allows the propeller to function in a practically undisturbed air flow. To have a plane of such startling originality of design break by an easy margin the world's most respected records is certainly a vindication of the principles analyzed and seems to open up a new era in commercial design.

The latest test places the Italian in the foremost place in regard to aeronautical engineering. The originality of conception of the Italian manufacturer, with the extraordinary methods of Dujo's process, has brought about results which are little short of marvellous.

Nothing to Be Gained

A QUESTION that is being constantly asked recently is, "What good are trans-oceanic flights?" The answer, as far as this magazine is concerned, is that further flights are, on the whole, more harmful than advantageous, particularly so if they are attempted in land planes. The remembrance of the value of publicity achieved by successful flights will be more than counterbalanced by the loss of life and the inevitable, though disguised, reaction on the part of the public will be that flying is still too dangerous to be indulged in by the majority.

On the whole, trans-oceanic flights have so far only confirmed what well advised people knew before they were attempted. At the same time, however, it cannot be denied that the spread of this knowledge has been a great help to the industry. The public had learned that taking off with its overboard plane is a dangerous undertaking. It has learned that our weather-reporting system is far from being adequate and that there is a great need of a more elaborate system. It

has come to realize the great importance of twice as standard equipment on all long distance planes. It has become conscious of the fact that flying is not an extremely difficult, and the part that increases play in making the most skilled of pilots in its class. It has also learned of the great need of real experts suitably laid out and equipped for the operation of heavily loaded transport planes.

All these things and many more were known by persons directly associated with the industry before the breaking of trans-oceanic flying. However, it took the spectators to drive home these lessons to the public and, if the truth must be known, to some of our most experienced pilots. Such being the case it seems that everything that could be learned from future attempts with similar equipment has already been learned. The value of the publicity to be obtained will continue to decline, but the danger will remain the same.

In a year or so when trans-oceanic flying equipment has been improved, renewed attempts will be worth while. However, at present, trans-oceanic flights in overloaded single engined land planes are not to be tolerated, and the leaders of such flights lay themselves open to the accusation of being willing to permit someone else to risk his life in order that they themselves may gain a little publicity.

Are They Worth While?

THE DAY when exhibition flights were the mainstay of commercial aviation has just passed but there is still the same need to attract passengers to flying fields. At many fairs, especially the smaller ones, parachute jumps are advertised at regular intervals so as to draw the crowd. At most of the fields where business is well established, parachute jumping is discouraged if not entirely forbidden, and there has been a considerable amount of talk about the Department of Commerce extending its regulations to practically prohibit exhibition jumps.

The question has many interesting angles and deserves a considerable amount of discussion. For it would not seem fair to regulate out of existence a branch of aeronautics, which in times past has played a very important part in the industry, without going into the matter pretty thoroughly. Personally, AVIATION believes that wing walking and other stunts in connection with a flying field are not worth while, but that parachute jumps are treated somewhat with good equipment are worth while. We would, however, like to hear from others on the subject and would welcome letters from flying field operators and others.

Airport Runway and Surface Treatments

By N. H. ANGELL

THE RECENT widespread interest in aviation has resulted in the construction of a great number of airports all over the Pacific Coast. In many instances, plots of ground have been not made and designated as airports and as yet little or nothing has been done to develop them to the point where they may serve other than that of an emergency landing field is justified. However, the start in the right direction has been made and the field can be greatly improved as funds are available.

The construction and proposed construction of these airports has raised a number of problems in engineering and



Plane taking off from old runway surface at Folsom (Calif.) Airport. The plane shows off new Folsom to background in making one-handed landing.

design, the solution of which is vitally necessary to the development of the land into a first class airport.

One of the highly important considerations in airport construction is the development of a suitable surfacing for the field, and particularly for the runway. The surface must be smooth, true in grade, as resistant as possible and free from loose gravel, dust, etc., which would fly from the air with the propellers.

For the fields where development funds are limited, two alternatives are open. Either a permanent pavement can be started and the area reserved so funds become available or a temporary surfacing can be constructed over the field, or on the major runways.

If possible, a start with a combination of the two methods would be advisable for the field in the process of development. A permanent pavement should be placed in and around the hangars and on the aprons and approaches. The lighter area and the runways can be given a temporary surfacing which will withstand the dust storms and provide a safe, firm runway surface in all seasons.

There is no doubt as to the desirability of a hard surfaced pavement for runways. The desirability of the advantages of a smooth surface even when the plane may be considered until the runway flying speed is attained is not new. The first successful flight of the Wright biplane was made by the aid of a crude asphalt and a road not "runway". The adoption of wheels on aircraft seemed to give the use of

permanent runways a temporary setback, but as the development of aircraft progressed with larger biplanes and later airplanes constructed, higher maximum flying speeds became the general rule. This meant longer and better runways in order to insure safe take-offs. In the case of trans-Atlantic attempts during the past year special runways were constructed down which the planes needed to give the initial impulse. Commander Byrd and crew at the heavily loaded "America" said such a runway

The old filled French plane "Old Glory" used the same ramp, but a wooden trestle work was added in order to increase its advantages. It was stated that the use of the ramp was equivalent to adding 500 ft. to the length of the field, thus demonstrating that it is the effect of a long runway that is desired, rather than actual linear dimensions.

Delayed take-offs, attempts, accidents and near accidents all due to poor conditions of runways are too common to need recounting.

The prevention of such accidents can be insured by providing runways upon which the planes can safely reach their required flying speed and still have extra space available, thus insuring a margin of safety and providing adequate compensation for variations in load or in air conditions.

In the past, the suitability of a field for the operation of a given plane has been largely determined by the length of the available runway. In the future it is apparent that the condition of the runways will prove an increasing factor in



Another view of the old runway of Folsom (Calif.) Airport. A comparatively light oil was used on the field and it was not dragged.

determining the suitability of the field as a base for the safe operation of a given plane.

It is the ability of the runway to provide a surface upon which the plane can maintain the necessary speed that will determine its worth. Length will still be a major consideration, but surface condition will be given more attention.

That surface condition makes a notable difference is illustrated by the recent successful trans-Atlantic flight of the

"Bismarck". In 1927 when preparations were under way for the take-off from Bremen, Germany, a paved runway was constructed. From this runway the "Bismarck" landed for which was to be a trans-Atlantic flight (her total weight was 4,000 ft.), took off in 1928 to 21,000 ft. Bremen airport was then described during the take-off from Bremerfeld Field as having given the distance traveled by the plane before taking the air at 3,000 ft., or practically double that required from a paved runway. This difference may at any time have



View of the old runway surface at Kern County Airport near Bakersfield, Calif. This field was added with a road oil with 60 to 70 per cent asphalt and then dragged.

been entirely due to a paved runway. A recent writing of flight data is not available to make a definite comparison, but the fact that it was considered advisable to give the runway at Bremen indicates that the difference in runways was an important factor.

If a better and safer airport can be obtained on the same plot of ground by surfacing runways and landing areas, such steps should receive immediate consideration from those responsible for the administration and maintenance of the flying field.

Also, if paving as surfacing runways will decrease the distance the plane must traverse before attaining flying speed, it follows that airports with paved runways should be somewhat smaller in size than those without well prepared surfaces. This fact may have an important bearing on the selection of a suitable plot of ground, especially if one's large airplane property values are high.

The best type of surfacing for the runways must be determined by the results obtained over a period of years and will no doubt depend to a certain extent upon airplane design and adaptability.

The growth of a rough or hard one on the landing fields and runways has been tried and found fairly satisfactory in some localities, but at best such surfaces have much to be desired in wet weather. They tend to become rough and muddy, water accumulates even during the rainy season, but the serious fault is that during the dry season the dust which the engine for irrigation water and dust updrafts is so much to be practically prohibitive, and entirely out of the question for the engine airports which are now subjected to only occasional usage.

The runway to which problem we find in some sort of surfacing which will present an even surface and which will be comparatively free from maintenance costs.

For a permanent surfacing asphaltic concrete is the most type used for highway construction after many alternatives. It can be laid without joints or cracks, so that it is desired and will present an even surface up to grade. It does not erode and is waterproof, thereby preventing water from seeping and softening the subgrade with resultant damage to the surface.

A constant measure of the adaptability of asphaltic concrete for airport paving was furnished during the World

War at Mather Field, near Sacramento, Calif. Here over 875,000 sq. ft. of first class asphaltic concrete was laid between hangars, an apron, runways and approaches. Despite the fact that the pavement was heavily laid under a wet test condition on a poor subgrade it is still in uniform condition after 16 years service with no maintenance.

Asphaltic concrete because of its sealing characteristics has a greater resistance to impact than other types of hard surfaced pavements. This feature is particularly important in an airport paving if hangars are to be made on the paved runways. The drivability of this will be discussed later. There is also the fact that the plane will be able to take off in some extent just previous to rising, and such housing would have serious results upon a surfacing not capable of standing heavy impact. The ability of asphaltic concrete pavements to withstand impact without damage is well known.

The reflectant nature of this type of pavement is also responsible for certain advantages. It makes it possible to be a greater extent than other types of pavement. This is especially desirable for airports located in the greater part of the "middle" to which it would be subject would be composed of a series of impacts. In addition to their effect on the pavement, such shocks have a very undesirable effect on planes and passengers, and very seriously may be reduced or eliminated, whether by dust clouds or clouds of pavement or both should receive every consideration. Later in properly discussing impact, the ability of asphaltic concrete to maintain reflectant has been proved.

There is comparatively no delay involved in paving with this type of pavement. It can be laid one day and used the next. If a permanent surfacing several days is sure to last, not only does it reduce under the time passed during the paving period, but it reduces necessary the use of surface treatments. There are no less liability from the air and pre-



The old runway surface at Kern County Airport about one mile after paving. Good night landing visibility can be proved by photo.

sent a real benefit when placed on a field. The above advantages are applicable in addition to existing pavement or patch work as well as in new pavement.

The flexibility of the asphaltic pavement is excellent for both day and night flying. It shows an excellent background for the standard 160 ft. width surfacing the airport and provides lines for parking, taxiway, and direction sections of white or orange paint contrast sharply with it. It is perhaps of less or mobility than smooth concrete when new, but it results in even take-offs and stands out by means of its uniformity. Other types of pavement, being especially light in color, may become slippery and dangerous, resulting in decreasing visibility. Light colored pavement makes necessary the use of dark colored pavements for guide lines, circle markings, etc. The Army Air Corps has definitely established the low

Continued on page 279

Increasing the Output to Decrease Costs

By ANDREW R. BOONE

EVERY MANUFACTURER naturally is interested in increasing production, for no volume for funds profit. And in increasing the production of planes he may risk to those profits by moving faster both on the orders placed for materials in quantity, but also in transportation of the raw materials. For example, if he places an order for steel, he designates certain size tubing, certain kind of rivets, certain wall thickness. This is made up as a special order. On small production, where steel is ordered for a small

in concentrating on a single model, supplying, of course, on material orders for special jobs. Three planes are laid down in units of six on a three-week schedule, and it takes approximately 60 days from the time the order is written until the plane is ready for flight testing. The solution of production, apparently, will be found in storing more planes per week.

The Maloney wing department recently arrived at a decision where, if it became able to take on one completed wing each working day, whereas the fuselage department is present are able to take out but one completed fuselage each day and another working day. This is a logical position at material, and is explained by W. O. Locke, production manager, as follows:

"The fuselage airplane factory will be coordinated in work in assembling, that material for planes like ours will progress in two sections from the starting point to the point where final assembling is done. Material for the fuselage will pass down one line and the wing for checking along the second, progressing side by side through the departments.

"The fuselage will come down to the jig department where the ribs are welded, to the housing department where they are joined together, through the wing department where the fuselage is tied up, into the next department.



The metal fitting department of the Maloney Company. It customizes the materials which are specified by the user.

next, then to the painting department, to the wing department where the wing is done, to the assembling department, then the wing department and finally the dope room where it will not make the wing is placed on in assembling.

"The wing will travel through a similar system, find the manufacturer of the cover, the ribs, assembling of the ribs and spars, and the setting of the wing, then the ribs, into the cover department which will be opposite the winging department.

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View of a section of the wing department of the D. F. Maloney Aircraft Corp., San Diego, Calif.

number of linings, this difficulty is not by expense. Quarterly orders would permit volume buying, shipment by freight and forwarding of the bills.

Many airplane factories in date have been provided with orders. It has been necessary that they ship by express in order to get goods in time for delivery of the complete plane. Yet, these manufacturers would save from 15 to 25 per cent, by paper buying and shipping. The new system is simple, which is all material, placed and added to order. Both steel and spruce orders placed from 30 to 60 days from the time the order is placed until the material reaches the warehouse ready for use in a plane. The general public wonders why it takes so long to build an airplane, and this partially explains the reason.

The foregoing idea came to the writer from W. O. Locke, production manager of the D. F. Maloney Aircraft Corp., in San Diego. Both Maloney and Locke view the application of something like a Ford production plant and methods to aircraft, at which time something resembling standard production will occur to the producers. At the same time the user will be assured a standardized product with interchangeable parts.

At the Maloney plant, the outcome, never has been met

Reducing Loss and Damage in the Airplane Factory

By WILLIS PARKER

SEVERAL HUNDRED dollars a month are saved by the Alexander Aircraft Co. by the adoption of a system whereby the manufacturer must make out a report to cover all materials as tools lost or broken.

The system requires several purposes. In the first place it has reduced the number of tools lost and broken and decreased the breakage of parts in the construction of airplanes, by increasing the vigilance of the employees. Another purpose is to determine the adaptability of certain tools to various kinds of work, for it is obvious that the wrong tool is likely to be broken or to damage a piece of work. A third accomplishment is that of salvaging some tools and materials that have been broken.

"Before we adopted this system," explained C. C. Harmsday, factory superintendent, "workers were extremely careless, apparently with small tools such as drills. If they lost a drill point or lost them, they thought it was of no consequence and immediately requested another. Of course a drill point doesn't cost much, but where they are being broken day after day and week after week, they cost more money."

"Consequently, the loss of 80 per cent of the broken tools. This way, by continuous in selecting the right tool for the work, or just plain 'don't-own-a-tool' was the reason to throw the broken piece into a corner or out of the window and get another. Now the worker must bring the piece

out a detailed report at the close, so may be able to learn from the report the broken part or get better raw material to eliminate the waste from breakage.

"The loss and savings reports must be in detail. We have provided plenty of space on the sheet for the employee to



Sub unit of an Alexander "Enterprise" powered with an 8X2 engine.

write an essay on the subject if he wants to, and the man decided the report is the better of it to do so. The report comes in an first and is completed in the form of a report book, for the first two weeks. "From January on with the following material or tools." It is submitted on me, but the materials are taken from the stock. When I requisition additional stock from the stock room, I must attach these reports to my requisition and they eventually reach the desk of D. H. Alexander, chief engineer of the company.

No Penalty Attached to Breakage

"We haven't attached any penalty to breakage or loss. That would tend to defeat one of our aims. If a worker knows he would be punished for breaking a tool, he wouldn't report it as a breakage but would discard it and report it as a loss, bringing someone else the making up with him. In some cases, no punishment due he has been wrong and broke. Also, he would declare that the material he was working with and broke was appropriated by someone else.

"We do watch the boys as regard to carelessness, and when we find that a man is careless, we retrain, so figure that, unless he improves himself, we will have to replace him with a better man. The result of carelessness, however, gives us an opportunity to give the worker a severe talking to, and that sometimes does to quick point as saving a penalty."

"When you stop to consider that we have had as high as 600 worth of breakage due to carelessness in a day, it is obvious that obtaining reports on the reasons why will help us reduce this loss to the source of time."

LOSS AND DAMAGE REPORT	
Name of worker and his department	
Date of report	
Tool or material lost or broken	
Reason for loss or breakage	
Value of tool or material	
Where lost or broken	
Signature of worker	
Signature of supervisor	

to the office, make out a report concerning the cause of breakage, and that report must accompany the requisition for a new tool. It frequently happens that an old machine is broken part. If it was a large drill that broke, we use it in the stock room where it can be sharpened and put into stock for use in other departments where starter drills are accessible.

"By studying these reports we have found that certain types of tools are not the best for the kind of work they are expected to do. Hence we discard them and seek something better, even if it means making the tool obsolete.

"The same thing holds true with materials, rather use or discarded. Where breakage occurs and the employee saves

Richard M. Mock Joins the Bellanca Company as an Aeronautical Engineer

RICHARD M. MOCK, who for the past year has been technical adviser at Anvers, has joined the Bellanca Aircraft Corp. of Wallingford, Conn., as structural engineer.

Mr. Mock was graduated from Tennessee State Normal, New York, in June 1923. In the fall of that year he entered the College of Engineering, New York University. From May through September of 1925 he worked at the laboratories and shops of the Westinghouse Corp., New York, and for the same period in 1925 Mr. Mock served as an inspector at the



Richard M. Mock

L. I. & B. Building Corp., Bronx, N. Y. From May through September of the following year he was located in the shops of the Locomotive Engineering Corp., New York. He then attended the Naval Engineering School of Aeronautics at New York University, having completed three years of mechanical engineering.

Mr. Mock graduated from that institution in June 1927 with the degree of Bachelor of Science in Mechanical Engineering. He was one of the winners of the Melville B. Baker Memorial Prize with a thesis on "The Distribution of Loads Between the Wings of a Biplane." His thesis, "Designing," was the paper was later published by the National Advisory Committee for Aeronautics in Technical Note No. 269. During the Fall of 1927 Mr. Mock took flying instruction at Curtiss Field, Long Island, N. Y.

Mr. Mock goes to the Bellanca company well qualified to perform all such duties as may be required. Not only has he acquired the theoretical knowledge but he has also had the practical experience to fit him for the position of aeronautical engineer. And added to that he is possessed of a good understanding of the conditions and problems that confront the aeronautical industry. His former working experience on airplanes and his many friends throughout the industry will for him the best of success in his new assignment.

Aeronautical and Mechanical Engineers Civil Service Examinations to be Held

EXAMINATIONS WILL be held by the United States Civil Service Commission for the position of Junior Mechanical Engineer and Junior Aeronautical Engineer. Applications must be on file with the Civil Service Commission at Washington, D. C., not later than August 7. The examinations will be for 100 candidates in various branches of the service throughout the country and the minimum salary will be \$3000 per year.

Candidates will be rated on general physics, mathematics, and engineering and aeronautical or mechanical engineering. The duties to perform are machine testing, inspection of equip-

ment material, drawing up plans for minor projects, preparing specifications for engineering material or apparatus, making experiments, making in conduct of experimental research tests, compiling reports and handling technical correspondence.

Fokker Super-Universal for Byrd Polar Flight on 10,000-Mi. Demonstration Tour

A FOKKER Super Universal monoplane equipped with a 410 hp. Pratt & Whitney "Wasp" engine is now on a 15,000-mile demonstration tour through the United States and Mexico, and is being piloted by Colonel E. H. Byrd, accompanied by George Coulson as mechanic. The plane left Toronto Airport, Hamilton Heights, N. Y., Sunday, June 24, and upon completion of the tour the plane will be turned over to Captain Richard E. Byrd who will use it on his forthcoming Antarctic Expedition.

This is the fourth Fokker plane to be purchased by Commander Byrd since he was named expeditionist. Its famous predecessor, the "Nymphodora" of his North Pole trip and the "Amelia" of his moonshot flight have achieved a large part in making aviation history. The plane is at present completely equipped with every device, a spare engine and a complete inventory but the interior will be completely refitted for Commander Byrd's expedition and the gas tanks installed to give it a one-day cruising range of over 5500 mi.

Are Already Flown More Than 14,000 Mi.

The plane was designed by J. H. G. Fokker and manufactured by the Albatross Aircraft Corp. of Hawthorne Heights, N. Y. This particular plane has already flown more than 14,000 mi. on a demonstration. Flights have been made on the plane state that its ease of control, extreme stability coupled with its extremely low landing speed and a high speed of 115 mph are its outstanding features.

The history of the tour is as follows: Chicago June 26; St. Paul June 28; Omaha June 29; St. Louis July 1; St. Paul, Minn., July 2; St. Paul, Minn., July 3; St. Paul, Minn., July 4; St. Paul, Minn., July 5; St. Paul, Minn., July 6; St. Paul, Minn., July 7; St. Paul, Minn., July 8; St. Paul, Minn., July 9; St. Paul, Minn., July 10; St. Paul, Minn., July 11; St. Paul, Minn., July 12; St. Paul, Minn., July 13; St. Paul, Minn., July 14; St. Paul, Minn., July 15; St. Paul, Minn., July 16; St. Paul, Minn., July 17; St. Paul, Minn., July 18; St. Paul, Minn., July 19; St. Paul, Minn., July 20; St. Paul, Minn., July 21; St. Paul, Minn., July 22; St. Paul, Minn., July 23; St. Paul, Minn., July 24; St. Paul, Minn., July 25; St. Paul, Minn., July 26; St. Paul, Minn., July 27; St. Paul, Minn., July 28; St. Paul, Minn., July 29; St. Paul, Minn., July 30; St. Paul, Minn., July 31; St. Paul, Minn., August 1; St. Paul, Minn., August 2; St. Paul, Minn., August 3; St. Paul, Minn., August 4; St. Paul, Minn., August 5; 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St. Paul, Minn., December 23; St. Paul, Minn., December 24; St. Paul, Minn., December 25; St. Paul, Minn., December 26; St. Paul, Minn., December 27; St. Paul, Minn., December 28; St. Paul, Minn., December 29; St. Paul, Minn., December 30; St. Paul, Minn., December 31.

Crown Motor Carriage Co. of Los Angeles Now Builds Kinner Airtor 3 Place Biplane

THE CROWN Motor Carriage Co., Inc., of Los Angeles, Calif., has recently obtained exclusive manufacturing and sales rights for the Kinner Airtor, a commercial biplane, known as the Kinner Airtor and Motor Car, one of Los Angeles. Production of a commercial vehicle will be now begun in accord with the demand of a market by the Crown Motor Carriage Co. The Kinner plane is of the two cockpit, three place type powered with a Kinner 25 hp cylinder engine of 150 hp. It has a maximum speed of 115 mph and a cruising speed of 100 mph.

The Kinner organization, with specialization in production of the engine and has placed day and night shifts in operation in its factory. In a short time it is expected that production will be stepped up to one engine a day.

First \$60,000,000 Candlepower Rainbow Beacon Installed at Mitchell Field After Tests

THE FIRST model of the super-beacon, manufactured by the Rainbow Beacons Products Co., Inc., of Long Beach, Calif., expected to be a great boon to night flying and to eliminate hazards of landing through mist and fog, has been permanently installed at the Army Air Base at Mitchell Field, Long Island, after a series of tests extending over a year and 100,000 miles of weather conditions. It was lighted manually at a government house.

The new Rainbow beacon is a lantern, glowing light, emitting the equivalent of 60,000,000 candlepower through electrified gas-filled tubes. By confining practically all of its power to the production of light without the ordinary heat, brightness, and vibration of the arc light it is far in excess of the beacon commonly in use.

During the testing period, the new light successfully penetrated fog and heavy mist for over 25 mi. and in clear weather, the average range was plainly visible to more than 70 to 80 mi. distant. It is said in the form of a searchlight but on an open lamp which, in addition to its immediate projecting beam, will diffuse light over the entire landing field and can also be used to flash code signals to other vessels.

Concerning Registered, Special Delivery, Insured, and Collect-on-Delivery Air Mail

MAIL FOR growth by special service will be accepted for registration upon the program, by postage stamps affixed, of the registry fee in addition to the air mail postage, it has been announced.

The registration fee for mail sent via airplane is 15 cents for rates up to \$50 and 20 cents for rates from \$50 to \$500 in addition to the postage stamps, and a 3 cent fee when a return receipt is desired.

The use of special delivery stamps in addition to the air mail postage will insure prompt delivery at office of address. The special delivery fee for mail sent via airplane weighing not more than two pounds is 15 cents, over two pounds not more than 30 lb. 15 cents, and over 30 lb. 30 cents.

Insured and collect-on-delivery and (third class) and fourth class (registered) mail, notwithstanding the parcels are sealed, will be accepted for transmission on airplane. The rates of postage are the same as for other mail transmitted via airplane service. The insurance and collect-on-delivery fees are the same as those for regular transportation of insured and collect-on-delivery mail.

Boeing Air Transport Co. Service From Chicago to Coast Now "Newly Organized"

ON JULY 1, 1933 the Boeing Air Transport Co., completed its first year of operation of the Chicago-San Francisco air mail route. Through a reorganization, it was reorganized by the United States Post Office at the June 25 act of Congress. The Boeing Air Transport Co. was newly organized to take over the Chicago-San Francisco route on July 1, 1933, the service being of, course, under the same July 1, 1933, act of Congress of the Boeing service was that law.

The Boeing Air Transport Co., a subsidiary of the Boeing Aircraft Co. of Seattle, has operated since the inception of the service between Chicago and the West Coast with the ground of success. Steady customers in traffic have been shown by the reports of the company during its initial year of service.

Production of 15 Planes Per Week Fails To Satisfy Demand for American Eagles

E. E. POWERS, Inc., 29, president of the American Eagle Aircraft Corp. of St. Louis, Mo., reports his factory has been unable to supply the demand for planes. Production up to now reached 15 or more planes a week. "When all soldiers of the United States could make money and not require," Mr. Powers said, "I have been known of the increasing interest in aviation among the people in all lines of business during the last few months. In the last few months we have had orders from all sections of the country for our factory. One was Gen. John H. Tamm, at Washington, who has a pilot's license. Another visitor was Col. J. Carroll Green, chief of the Air Corps, who has a pilot's license. A candidate for pilot's license in his home state, expects to see a plane a great deal in making his company. C. M. Hoyer of Kansas City, Mo., another visitor has purchased a plane in which to hunt coyotes. The latest the latest order at \$5 to \$15 will make the plane pay for itself."

European Tourists Offered Land and Air Tour from Los Angeles to San Francisco

A COMBINATION air and highway sightseeing tour of California, planned especially for European tourists, has been announced by the Southern Air Lines, Inc., and California Pacific Air Lines, Inc.

The tour will combine a 40-hour motor trip from Los Angeles through the San Joaquin Valley to San Francisco with the return trip to Los Angeles via a Mexican Pacific plane flying over the route.

It is planned to book most of the passengers at their homes in New York from Europe. The combination trip is now available and is thought to be the first service of its kind that has been offered in this country.

Aeronautic School, Inc., of Wichita, Kan., To Offer Aviation Correspondence Course

THE AERONAUTIC School, Inc., a firm organized for \$50,000 preferred stock and 100,000 shares of common stock, has been organized and will begin in Wichita, Kan. Presided by the school will be the following: A. K. Kuching, president; C. M. Hoyer, vice president; and C. M. Hoyer, vice president of the aeronautic division of the Department of Commerce, George Arlson, former Marine pilot, G. D. Spangler, U. S. Navy, and Roger Arlson, all of Wichita.

The new enterprise will offer a correspondence course as a means of instruction not doing directly with the management of a plane in the air and would a special ground school flying school there.

United Airways, Pinhook, N. J., Enrolls New Students for Complete Flying Course

THE NEW flying school opened by United Airways, Inc., at Pinhook Airport, Pinhook, N. J., recently enrolled its new students making a total enrollment of 54 for the full ground and flying course. Instruction is given by Maj. L. J. Kivick, formerly at the Ohio Flying Club at Dayton, Ohio, and Henry Hoyer.

United Airways, Inc., has been in operation since the first two months and to that date has acquired 52 x 50 ft. Biplane of light biplanes and complete shop equipment. Two Travel Air biplanes and a Cessna, complete the fleet. All activities are under the direction of B. C. Newman, president of the association.

National Organization Formed to Found Aviation Country Clubs in Leading Cities

A NATION-WIDE expenditure for the formation of flying clubs in the principal cities of the United States was initiated recently by the opening of the executive office of the Aviation Country Clubs, Inc., at 224 Fifth Avenue, New York City. The Board of Governors include William A. Rockefeller; Charles Levenson, president of Wright Aeronautical Corp.; Sherman M. Funchak, president of the Fairchild Aviation Corp.; Robert Lee, Jr.; George Peck, president of Free Motion Craft; Karl D. Osborn, publisher of Aviation Magazine; and James B. Taylor, vice president of Air Associates.

Present in the Organization Committee is Earl Newland Nichols, Junior League member and holder of F.A.I. Highways License No. 408 and Department of Commerce Transport Pilot's License No. 536. Associated with Mrs. Nichols on this committee are George J. Adams and John A. Reeves. Miss Nichols is devoting her entire time to this project. She has done a great deal of flying. Her last long flight was the first non-stop trip by air between New York and Miami, and she is very active at this moment in advancing aviation in America.

National Membership Committee Appointed

At the first meeting of the Board of Governors a National Membership Committee was elected including Estelle Macauliffe, president New York society girl, Princeton, and W. A. Lewis, Hilda Harrison. The membership already includes Governor Levenson, president of the Levenson Aeronautical Corp.; Edward T. Sperry Gyroscopic Co.; George Tennyson, president of the Koko Motor Co.; Nathan Conway, and R. O. Macauliffe.

The club committee is now at work choosing suitable locations for the first eleven Aviation Country Clubs. One is to be located in Washington, one on Long Island, and one in New Jersey. These clubs will include flying fields with proper runway arrangements and modern, and the equipment will consist of airplanes, machine shops, ground field equipment, and a number of airplanes. The flying fields and the clubhouses will be of modern design and appearance. The style of architecture is modernistic, and the buildings are to be constructed in steel in order they may stand against hurricanes. Provision are being made for a large lounge flying room, kitchen, locker room, and various quarters on the ground floor; sleeping quarters, a grill, men's smoking room, and another large lounge for ladies on the second floor.

Flying Clubs to be Organized in the Large Cities

Flying clubs under the present plan of the Aviation Country Clubs will be formed in cities of 100,000 or more population. Provision of organization involves the application to the National Board of Governors of 10 representative citizens of independent social and business standing. This names must be acceptable to the National Administration Committee, and their application passed by the National Advisory Committee. These 10 applicants will organize a temporary Board of Managers for the Flying Club.

The National Advisory Committee will conduct for the local Board of Managers in each city a membership drive and will undertake the conduct of sufficient members to provide the necessary funds for a fully equipped club. After 50 per cent. of the membership necessary under a budgeted plan for the financing of the club has been received, a meeting of the members will be called, the permanent Board of Managers, officers, and committee elected and appointed,

property for the club selected, and the incorporation program undertaken. An Advisory Committee has been formed for the purpose of aiding in the formation of flying clubs throughout the country. This committee will consist of the Board of Governors of the club, together with two members appointed by the membership of each flying club formed.

Aviation Country Clubs give each member the privilege of all state and flying facilities in all states where an Aviation Club is formed. The plan follows closely the formation of the very successful field flying clubs in England, Canada, and Australia.

Lieut. Wade Will Attempt 15 Day Flight Around the World Starting from Chicago

A BOUND-THE-WORLD airplane flight whose object will be definitely to lay down a route for world-beating trips and for international trade, is being provided for a take off August 20 from the Chicago lake front, with the return date set for 10 days later.

Lieut. Leigh Wade, who had completed the first world flight made in 1925 by U. S. Army pilots, will be in charge of the expedition. Assistance will be by Capt. Bradley Jones, who is now chief of the bureau of air navigation, and who will act as navigator on this flight. Floyd K. Smith, a native Chicagoan, will go as relief pilot and a mechanic as to be selected later.

A syndicate headed by R. C. Watts, a banker, has been organized to raise the required \$210,000 to finance the flight.

From the mouth of the Chicago River, where the take off is to be made, the plane will fly to San Francisco, thence to Honolulu, Midway Islands, Tokyo, Hong Kong, Calcutta, Bombay, Canton, Shanghai, Kanton, the Amoy, Swatow, and China.

The plane, a high speed, all metal, Dornier monoplane, will be equipped with powerful twin 600 hp. Curtiss engines and will have a cruising speed of 120 m.p.h. It will not be longer than 28 ft. but the cruising radius of the plane will be 35 mi., so that there will be a liberal margin for safety. The longest leg will be over the 2000 mi. from the Midway Islands to Tokyo.

Massachusetts Passes Bill Revising Law Governing Operation of Aircraft in State

AN ACT revising the Massachusetts laws relative to aircraft and bringing them up to date and in general agreement with the Federal Air Commerce Act was signed recently by Governor Fuller. Under the provisions of the new law the right of private flying in Massachusetts is extended to pilots licensed in that state or by federal authority, other states, or foreign countries. The register must grant commercial and limited commercial state licenses and commercial flying is permitted by pilots licensed by it by federal authority, other states and foreign countries for a period of 10 days.

No registration is required for aircraft registered under federal law or for private flying by another state or foreign country. Flares are prohibited from flying lower than 5000 ft. over cities or thickly populated areas. Landing fields are to be established by the Commonwealth or by cities or towns and the Department of Public Works may make, alter or revoke rules and regulations governing landing fields whether established by public authority or otherwise.

The Register may under certain conditions revoke a pilot's license or right to operate or the registration of right of operation of an aircraft. Operation under the influence of liquor shall be punishable by imprisonment.



Mail, afloat. Goodyear, carrying blimp service on National Air Tour.

GOODYEAR Service rides with the fleet on the Fourth National Air Tour. From Detroit to the Coast and back again, every pilot will know that close at hand is a Goodyear man, riding in the Ryan Broughman entered by the Mutual Aircraft Corporation—plane No. 16 piloted by Vance Breese—ready to render all possible help.

Goodyear Branches, and Depots, all along the route, will cooperate

with the Goodyear representative to insure every ship in the tour the help of the world's greatest rubber company in keeping schedule.

Just another example of how Goodyear places its resources at the call of aviation. Manufacturers of airplanes, operators of air lines, and owners of private planes, will find Goodyear always ready to help.

Goodyear makes tires and everything in rubber, for airplanes. Write for information.

THE GOODYEAR TIRE & RUBBER COMPANY, INC., AKRON, OHIO

GOODYEAR
AIRPLANE TIRES
TRADE FOR THE world's AIRLINES

Stinson Jr. Cabin Monoplane With Warner Scarab Engine in Ford Reliability Tour

AMONG THE new engines to be seen at the National Air Tour this year is a Warner Scarab five-cylinder air-cooled model. It is the power plant of one of the two Stinson Jr. four-place cabin monoplanes piloted by Randolph G. Pease, who will be remembered as the pilot who in last year's tour covered several states in a Buhlert Monoplaner. He is carrying as passenger S. A. Christensen, test engineer of the Warner Aircraft Corp. of Detroit.

It was learned at the Warner factory that the factory is now putting through a factory order for 126 engines which are being assembled at the rate of three per week. Parts for the Warner engine are being produced by a group of leading Detroit engine parts manufacturers under close supervision by Warner engineers. The work at the Warner plant is present in assembly and testing only. The plan is to build 580 engines by means of precision manufacturing methods before the Warner corporation undertakes complete assembly of the engine in its own plant. A period of 18 months is the time estimated to complete the first 500 engines.

The Warner Aircraft Corp. and its divisions, through their work of the most prominent automobile men in Detroit, have not been carried off their feet by the engine shortage situation, preferring to step up production gradually while making their product closely in the field and profiting by the experience and performance of each unit.

Aram Algharian, 15, of Detroit Wins Model Contest of Airplane League of America

ARAM ALGHARIAN, 15 yr. old Detroit boy, established a new world's record in the finals of the first national meet of the Airplane League of America held in Detroit June 28 as one of the winners of the Air-Glympics. Algharian's top model airplane measured about five feet six inches, weighing less than the national color rule and a trip to Europe. Another boy of 15 yr. won a trip to Europe in the outdoor contests. He is Thomas C. Hall of Winston-Salem, N. C. First prize in the outdoor contests was won by Joseph A. Lewis of Chicago, but as he is more than 20 yr. old, and the rules state the winner must be less than that age, Hall, second prize winner, won awarded the trip.

Besides the trips to Europe and the float engine and national outdoor trophies, winners in the junior and senior divisions of built events were given checks for \$2500 apiece by Commander Richard E. Byrd, Orville Wright, and Griffith Ogden Kinn, editor of the *American Boy*.

Carl T. Carlson, 39 yr. old, Chicago, was the junior winner, and William Leffler Dutton, 17 yr. old, Miami, Fla., was the senior model master. George Thompson, 20 yr. old, Kansas, N. D., won the junior solo model contest. The three day contest attracted more than 500 airplane model enthusiasts.

William Walt, Jr., Airplane Designer, Joins Engineering Staff of Chance Vought Corp.

WILLIAM WALT, Jr., well known airplane designer, has been made a member of the engineering organization of the Chance Vought Corp. of Long Island City, N. Y., succeeding to an engineering model recently by George W. Vought, president of the corporation.

Walt was formerly one of the chief assistants in plant of service of the engineering department of the Curtiss company, having first entered the Curtiss employ in 1917 at the Buffalo plant. When the engineering and experimental de-

partment of the Curtiss company was removed to Garden City, L. I., Walt was transferred there. He learned to fly in 1923 and has been an active race plane pilot, this being in line with the Vought policy to have all their engineers and experimental employees active fliers.

Two Texas Organizations Unite to Build Airports from Gulf Coast to Kansas City

CONSIDERABLE INTEREST in the plan of the Beaumont Aero Club to serve the establishment of a string of airports from the Gulf Coast to Kansas City through East Texas and over the Ozarks has been evidenced by institutions along the line selected. The movement is being sponsored jointly by the Aero Club and the Texas Highway No. 8 Association.

The first of the airports has been located at Jasper, Tex., about 75 mi. north of Beaumont where a site was selected by C. C. Scott, manager of the Shiloh Airways, Inc., and Frank L. Burtchick, Beaumont city park superintendent, who made the trip by air to look over the proposed location as representatives of the Aero Club. The first section is 25 miles and is now under half miles from the town. It will be ready for use the latter part of July.

Kansas's new road construction and when the field is finished it will have three landing strips, one north and south 3000 ft. long, one east and west 2000 ft. and the other diagonally at 2400 ft. Committee from the chambers of commerce of Marshall, Jefferson, and Killebrew, Tex., are now looking over sites for airports and it is expected that by the time the Jasper location is ready, several more will have been selected.

German Dirigible to Fly Across Atlantic and Continue Flight to San Diego, Calif.

DR. EMMO EISEN of Berlin, a member of the German Research Institute of Aeronautics, recently discussed latest dirigible design and safety measures with Dr. Karl Arndtson, vice president of the Goodyear Zeppelin Corp. at Akron, O.

Dr. Eisen is a consulting engineer for the Research Institute, and as such will be one of the group of experts who must approve the new German dirigible ZIG before it will be completed by the German government. It is planned to fly the 127 across the Atlantic in Lufthansa, N. Y., and then to continue to San Diego, Calif., the trip to be made sometime in August or September. It is possible that the tour will be continued around the world, according to Dr. Eisen.

The new German dirigible is about 80 per cent. larger than the Los Angeles, but is smaller than the Zeta passenger. Requested for the United States Navy, which the Goodyear Zeppelin Corp. hopes to construct.

Stripling Flying School, Macon, Ga., Offers Passenger Service to Atlanta and South

AIRPLANE PASSENGER service from Macon to Atlanta, Ga., and other points is now available through the Stripling Flying School at special rates, it was announced a few days ago by W. L. Stripling, Jr.

The Stripling plane will carry passengers to Atlanta at a special rate of \$25 per trip at \$25 for a round trip and also equipment. Trips to points in South Georgia and other southern states also may be obtained.

A number of persons already have availed themselves of the opportunity of making quick trips by airplane, Stripling said.

WACO

-- takes off with full load in five seconds from standing start

-- lands in three seconds from time wheels touch ground to dead stop.

The official figures for WACO entry No. 18 in the National Air Tour, loaded to 2600 pounds were 5.06 seconds for take off and 3.04 for landing.

The Sensation of the Detroit Meet

WACO'S ability to get in and out of small fields is not only a factor of great safety in cross-country flying but a factor of great profit to the commercial operator.



The Advance Aircraft Co. TROY OHIO

B.B.T. Corp. of America to Supply Lighting Equipment for Fairbanks, Alaska, Airport

THAT NIGHT flying is steadily increasing in popularity is evidenced by a report of recent sales from W. B. Blandman, general manager of the B.B.T. Corp. of America, manufacturer of airport lighting equipment with headquarters in the Astoria Building, Philadelphia, Penna. Not content to be the air field under the scrutiny in lighting includes many private and commercial airports which are making provision for night operations.

Because of the great amount of flying in Alaska where the days are short, the necessity for night flying facilities has become obvious. First in the territory to be lighted, the airport at Fairbanks will have a B.B.T. floodlight and a flashing beacon.

Operating at a night schedule the newly inaugurated airway between Toledo and Detroit requires a floodlighted airport at both terminals. The Transcontinental Airport of Toledo, Ind., has just installed a B.B.T. air operated floodlight of the type used at the principal airports of the New York-Texas Petroleum air mail route. The Ford Airport at Dearborn, Mich., serving as the Detroit terminus, will provide four of the new B.B.T. intermediate floodlights.

Among the western airports to be lighted is Van Nuys, Los Angeles, where the Western Air Express is installing a B.B.T. air operated floodlight, boundary lights and a flashing beacon of the new monomeric type. Reno and Elko, Nevada, will also be lighted, B.B.T. floodlights having been provided for each of these airports.

Other recent B.B.T. lighting installations include the East Boston Airport, Boston, Mass., and the airport at Columbus, O.

Public Improvements Bond Issue Assures New \$3,000,000 Airport for Pittsburgh

PITTSBURGH HAS just been accorded a very large advance through the action of the voters in approving a \$3,000,000 bond issue for public improvements in the Pittsburgh district. The total set-up for an airport is \$1,000,000, divided equally between the County of Allegheny and City of Pittsburgh. The airport site is being chosen by a Special Airport Survey Committee of the Chamber of Commerce, headed by A. B. Brown, president of the Federal National Bank of Pittsburgh. In choosing the airport, the Committee is taking into consideration a site which will provide ample space immediately adjacent for several most important purposes. The Aero Club of Pittsburgh took a very active part in obtaining public approval of the airport, by supplying its own speakers, to cover forty bond issue meetings, luncheon clubs, and by a series of radio talks.

Bolger Field, the present 40 acre municipal airport, which was established in 1921, has been found to be too small for future needs. The U. S. Government holds a five year lease, with a five year renewable option, upon Bolger Field, for use as an Army Reserve Field, with Capt. Thomas B. Von, U. S. Army Air Corps, commanding affairs.

West Virginia Waco Sales Co. to Instruct Students in Navigation and Meteorology

COURTESY IN navigation and meteorology in preparation for Department of Commerce examinations for pilot licenses will be given under the auspices of the West Virginia Waco Sales Co., Wheeling, W. Va. These courses will be given evenings by Ensign B. M. S. Adams, professor of mathematics at Loyola University, and Capt. Jack Adams of the Army Air Corps. Students may enter at any time.

Women of Wichita, Kan., Meet with National Air Tour Visitors and Form Flying Club

ARMED WOMEN of Wichita, Kan., are organizing the third women's flying club in the United States. Detroit women organized the first and Milwaukee leads the second. Wichita women, identified in some way with the airplane industry, met with visiting women on the National Air Tour there on the night of July 2 and laid the foundation for the flying club. Officers will be elected at a second meeting to be held shortly.

Mrs. Victor Ross, wife of the general manager of the Standard Airplane Co. of Wichita, presided at the meeting. Visiting tour women spoke briefly. Mrs. Frank M. Hewitt, whose husband is piloting the big Ford tri-engine plane as the tour, revealed the fact that she has traveled 30,000 miles by air since last February. She and her husband spent their honeymoon flying in the 1927 tour.

Mrs. Florida Ferguson O'Neil, only woman competitor in the national tour and the first woman ever allowed to fly alone in such a tour, said she learned to fly because everyone told her couldn't. She took up flying in 1923. As a reward for flying for some time she also has made several parachute jumps. Other visiting air women who spoke briefly were Mrs. Edith Brown, Mrs. Ray Cooper of Detroit, whose husband is one of the tour leaders, and Mrs. Bart Hall, Houston, Tex.

It was agreed that country membership will not be sought. It will be limited to women who actively fly, are interested in aviation or who will work as behind all aviation.

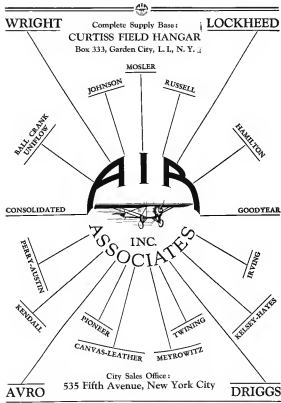
Road, McNally & Co. of Chicago Publishes Large Scale Aviation Map of United States

THE NEW Standard Aviation Map of the United States is now being published by Road, McNally & Co. of Chicago for use in rapidly expanding business, pleasure, flying travel and sales, and possesses all the features essential to a general reference map of the country. It is 18 1/2 by 11 1/2 by 4 1/2 in. is one and has a readable surface, making it possible for the user to make new locations of airports and routes and to make corrections in these markings when necessary.

The simple matter of 25 in. to the inch and the necessary markings enables at 100 mi. intervals most computation of air line distances and flying times an extremely simple matter. It is drawn as a mass pagebook bound on two standard portfolios and it is due to this provision that the map has the least possible distortion as a flat surface map of the United States. The greatest straight line distance in the country, that from Washington to Miami, may be determined from the map with an error of less than one per cent. All cities and towns of more than 5,000 population and all weather, station, track and railroad are shown and the large size permits the carrying of accurate data without hindering legibility.

Alliance Aircraft Motor Corp. Now Using Old Moogam Ordnance Building for Factory

THE BUILDING at the Moogam Ordnance plant at Addison, O., is now being used by Alliance Aircraft Motor Corp. as a factory and about 50 cars and planes are under construction there. Manufacture of the Allen Aircraft Co. of Wyandotte, O., has been moved to Alliance and installed in the new plant which is now building the Hen engine. The first complete plane will be test flown in the near future by Capt. Fred Oles, test pilot for the Alliance Aircraft Motor Corp.



Keystone Aircraft Corp. of Bristol, Penna., Building New Type Naval Training Plane

THE KEYSTONE "Pop", manufactured by the Keystone Aircraft Corp., Bristol, Penna., is one of the most versatile airplanes to be built by that company for the U. S. Navy. The airplane, which is designated N2V-1 by its makers, is to be used by the Navy for instruction in land and flexible gunnery, bombing and spotting. It is a two plane convertible land and seaplane and is powered with a Wright J-5 Whittcomb engine and a Standard Bop propeller.

In recent test flights the Pop climbed at the rate of 550 ft. per minute and was put through a series of maneuvers



land, flew well, recovered gracefully and landing accurately in the new Keystone "Pop" type plane. The craft is a two place convertible land and seaplane.

To determine the reaction of the plane under severe conditions, in all of the tests it gave proof of the exceptionally rugged construction, ease of control and steady to withstand hard service for which it was designed.

As in the majority of American built planes, the fuselage is constructed of chrome nickel-silver steel tubing, welded in the form of a box. The wings are steel and duralumin. The tail surfaces are also steel, being covered with fabric. The stabilizer may be adjusted from the pilot's seat and



The "Pop" converted for sea work.

control surfaces are actuated by a system of cables. The rubber pulleys are adjustable under a wide range of use. The tail steel is rubber wrapped and it is designed to be flexible during the ground.

The wing is of conventional construction and the same used in the U.S.A.-35-S. Chrome struts attached to the upper fuselage improve support the outer section and are so placed as to prevent any stress to the forward cockpit. The retractable struts are of the S type. Flexible ailerons are employed and hinged at the top of each wing panel. Two gasoline tanks, having a total gasoline capacity of 40 gal., are built into the outer section. There are no fuel tanks in the fuselage.

The engine mounting is of steel tube construction and is placed in the fuselage at four points. A head-on start-

er with a booster magnet is installed on the engine. Repairs may be made easily at the back of the engine and to fuel lines and control rods by removing the cowling.

One fuel gasoline gun may be mounted in the fuselage, firing through the propeller and operated by trigger on the control stick. The rear cockpit is equipped for the installation of a flexible machine gun. Bomb tests for light bombing practice may also be installed on an additional fuselage. The plane is equipped with a pressure fire extinguisher and all of the usual instruments necessary for military flying. Ample space has been provided for the installation of radio apparatus.

Various long a primary requisite in military flying, the plane has been designed in such a way as to provide adequately for this important factor. The stabilizers are so arranged to afford sufficient protection without adding unnecessary parasite resistance. The absence of a fuselage tank leaves ample space for storage and increases the size of the cockpit.

Seaplane 245 lb. heavier

The landing gear is of the split type with a hydraulic shock absorber arrangement. In the seaplane conversion the pontoons are attached by S type struts to the fuselage. The weight of the land plane is 2502 lb. and that of the seaplane 2747 lb.

Specifications:

Wing area 325 sq. ft.
Aileron area 26.7 sq. ft.
Stabilizer area 18 sq. ft.
Elevator area 16.2 sq. ft.
Fin area 3.3 sq. ft.
Builder area 19.5 sq. ft.
Horizontal surface area 30.2 sq. ft.
Vertical surface area 12.6 sq. ft.
Wing curve 1.84-38.3

Dimensions:

Span, upper wing 37 ft.
Span, lower wing 32 ft. 4 in.
Length, land plane 30 ft. 7 1/2 in.
Height, seaplane 15 ft. 1 1/2 in.
Length, land plane 26 ft. 5 1/2 in.
Length, seaplane 28 ft. 7 1/2 in.
Tip, upper wing 5 ft. 3 1/2 in.
Tip, lower wing 5 ft. 1 1/2 in.
Stagger 15 in.
Distance (both wings) 5 deg.
Sweepback 0 deg.
Camber (both wings) 80 in.
Incidence (both wings) 6 deg.
Span of tail plane 13 ft. 2 in.

Performance:

Max. speed 145 m.p.h.
Max. speed 45 m.p.h.
Climb in 30 min 5500 ft.
Service ceiling 10,000 ft.
Endurance at full speed 2 1/2 hr.
Endurance at cruising speed 4 1/2 hr.
Range at full speed 250 mi.
Range at cruising speed 375 mi.

Miss Ruth Haviland, Flying Enthusiast, Taking Course to Obtain Pilot's License

MISS RUTH Haviland of Kansas City, Kan., who "broke into aviation" with her efforts to obtain patents with Conner, Richard H. Ford, on his flight to Europe, is now making solo flights at a Kansas City air school. She, taking a course with the view of becoming a licensed pilot.



Ancient and Bullet-Riddled —Still flying every day in Nicaragua

WHEN the Marines landed in Nicaragua, according to Major Bernard's story in a recent issue of "Collier's", they found two young American soldiers of Fortune, Major Mason and Brooks, comprising the personnel of the Nicaraguan Federal Air Force.

TWO SWALLOW PLANE, ancient and decrepit, were their equipment. In these two old-time planes on which they had mounted antique machine guns, Mason and Brooks suffered both duty to "start" the enemy with machine gun fire, and drop bombs made bombs in their hands.

But old they were—these old-time Swallows and brought these planes safely back after each sortie, over mountains and jungles—in Nicaragua, where these old-time planes would crash out and crash the additional bullet holes torn down last all with the enemy. What fun where could be added to the attention of these ancient Swallows? How many more they had kept in service—what they represent before meeting Nicaragua—no one knows. You seen in these old models, Swallow engineering principles were right—perhaps under the hardest kind of service.

Personality of today's magnificent Swallow which has recently taken on glass along the bodies of the Swallow for conversion. Suppose the latest growing plane in production and reliability on the American market. No wonder Swallow covers everywhere are undiminished—no wonder Swallow doesn't let making new money and spare machines are rapidly being snapped up.

Let us tell you more about the Swallow—America's Favorite Commercial Airplane—and the production for a betterer dealer arrange near in your territory. Write us today.



The Swallow by Swallow

Victor H. Roen, Genl. Mgr.

SWALLOW AIRPLANE COMPANY
WICHITA, KANSAS



Production Vought Corsairs Tested and Found Superior to Experimental Models

A VERY interesting series of tests was recently made over the official Navy speed test course at Anacostia, D. C., by Lt. Col. George A. C. Miles, U.S.N., and Lt. Col. W. G. Calverly, U.S.N., of the Flight Test Section, Bureau of Aeronautics, to determine practical characteristics of one of the new production type Vought "Corsairs," and the superiority in speed of these planes over the experimental planes delivered last year, and which established their world records.

In all three trials, a nine-foot diameter, two-bladed, adjustable pitch duct propeller was used, it being the type designed by Lt. Col. George A. C. Miles of the Bureau of Aeronautics, Navy Department, and manufactured by the Standard Steel Propeller Co. of Pittsburgh, Penna. In each case, the gross flight weight was approximately 3500 lb., and the planes were so loaded so that a direct comparison could be made with the experimental planes.

Under the same conditions, the standard production Corsair airplane showed a level average speed of 339.1 m.p.h., piloted by Lieutenant Calverly, U.S.N., at four successive runs up and down the course. In the afternoon of the same day, after the pitch of the propeller had been increased slightly, runs averaging 358 m.p.h. were made by the same pilot. The next day, with the same propeller setting, but lower engine rpm, attributable to atmospheric conditions, Lt. Col. George A. C. Miles, U.S.N., made three runs over the measured course at an average of 354.8 m.p.h.

Temple N. Joyce Continues Trials

These tests followed a series of timed trials made by Temple N. Joyce, pilot and service manager of United Vought Corp., with Lieutenant Calverly as observer and observer. Mr. Joyce's runs averaged 356.7 m.p.h. with the propeller setting holding the engine down considerably below its rated r.p.m. This was the case in all runs, due to changes in pitch settings, except for those made by Lieutenant Calverly at an average of 339.1 m.p.h. in the initial runs.

As a land plane, the Corsair showed an average speed of 339.1 m.p.h. A slight modification in propeller setting was then tried, with the result that Lieutenant Calverly was able to average 348.7 m.p.h. with the engine turning at rated speed. The production model has easily been proven to surpass the high speed characteristics of the earlier experimental models, with the added circumstance result that the production Corsair airplane, loaded as a two motor fighter, is practically as fast and as maneuverable as the same plane as a land plane-observation type.

Oakland, Calif., Boy Wins Prize in Model Contest Held by Boeing Air Transport

A 24 in. model of a Boeing Air Transport mail plane, built by an Oakland, Calif., boy, was first prize in a contest held at Oakland recently. The plane was sent to Detroit to compete in the national model contest held there.

Details and perfection of the model were greatly admired by the judges. The cockpit contained all the instruments and the stick. Brake levers, safety belt, stallion control, and even the pilot's nose were there. Two wings held the model put covers usually. To the passenger cabin, enclosed by two glass paneled doors, were the seats and luggage rack. Boys who entered the contest were supplied with specifications and drawings of the plane by the Boeing Air Transport traffic office.

The Keystone "PUP"

A newly designed Training Plane — built to suit the specific requirements of the U. S. Naval Air Service as a land or seaplane.

Performance, Maneuverability and Maintenance — synonymous with "Keystone" in Aircraft circles—have indicated the "Pup" as the Training Plane of the future.

Keystone Aircraft Corporation
BRISTOL, PENNSYLVANIA

TRADE MARK FOR KEYSTONE AIRCRAFT



For The Discriminating Purchaser:

THE AIRSEDAN

AIRLINE OPERATORS will find this plane meets with all their requirements. The cabin has exceptionally comfortable seats for large passengers and the pilot's visibility is unexcelled.

PRIVATE OWNERS will approve of the fine appointments which are selected to satisfy the most critical taste.

CORPORATIONS desiring to keep step with the progress of the times will find that here is an efficient and up-to-date vehicle for transporting executives and personnel to widely separated branches.

We will be glad to assist you in determining the adaptability of this fine product to your requirements.

BUHL AIRCRAFT COMPANY
Marysville Michigan

Western Combination Planning Routes Between Chicago and Pacific Coast Cities

PLANS FOR a western network of commercial air routes connecting in Chicago and with Portland, Ore., San Francisco, and San Diego, Calif., as their western termini have been announced by Charles V. Eklund, president of United Air Lines, the Oregon corporation which recently completed the West Coast Air Transport Co. Their great highways capable of carrying 35 passengers each have been ordered from the Bush Aircraft Co. of Santa Monica, Calif.

A new company, Piedmont Airways, is being organized in Los Angeles to operate the lower south of San Francisco. The United Air Lines will cover the northern territory. Although separate concerns, they will work together, under practically the same management.

The new routes will be operated on a daily basis in San Francisco so which it was said that the United Air Lines would operate an airplane stage service east from Southern California and that temporary headquarters would be moved from Portland to San Francisco. United Air Lines headquarters will remain in San Francisco.

On August 1 passenger and express service between Portland and San Francisco, now three weekly, will be made daily. Daily service between Portland and Spokane, Wash., will be started August 15. As soon as possible biweekly daily service from Portland to Rich Lake City, to Denver, to Kansas City, to Chicago, and from San Francisco to Rich Lake City is expected with the northern line will be started. Portland-Spokane service is now on a daily schedule.

Both Companies to Use Bush Planes

The Piedmont company plans to start daily service from San Francisco to Chicago by way of Los Angeles, San Diego, Phoenix, El Paso, Dallas and St. Louis. Both routes planes will be used exclusively by both United and Piedmont companies. Eklund has been made a director in the Rich concern and a substantial amount of stock is being purchased by Piedmont interests.

United Air Lines is an organization of officials of Piedmont Stage System, a transportation and maintenance stage line. The Piedmont Airways will be a direct subsidiary of the stage line.

The standard planes have already been designed by L. Meritt Bush, president of the Bush company. Each plane will have two engines with a total of 1700 hp. There will be two main engines, one directly above the other, with the pilot's cockpit between. Upper wing spread will be 34 ft., lower 60 ft. (overall length will be 52 ft.) The plane will weigh 17,000 lb. and will have eight landing wheels.

Engine power for a high speed of 150 m.p.h. and a cruising speed of 120 m.p.h. There will be making compartments, living rooms, lavatories and other space for 35 passengers. The cabin will be double decked, 18 passengers above and 20 below. On short runs the lower section will be converted seating room for 35 passengers. Construction of the four planes is to begin August 1. Two will be taken by each company.

New 3,000,000 Candlepower Beacon Placed On Roof of Biltmore Hotel, Providence, R. I.

A GLASSY beacon, generating 3,000,000 candlepower has been placed on the Biltmore Hotel, Providence, R. I., and will be operated from sunset to sunrise. It is an official Government Aeronautics beacon and will be indicated on all navigational charts and for maps in the future.

The beacon measures 28 in. in diameter and can be seen from 35 to 50 mi. on clear nights. The cone of the light can be read from a height of 1000 ft.

Plan Great Aircraft Industrial Center For Los Angeles Metropolitan Airport

THE LOS ANGELES Metropolitan Airport has been established to fill the long felt need at the aircraft industry of Southern California for permanent locations from which to conduct their business. It is located in the San Fernando Valley and is close to the center of the origin of the Los Angeles air passenger travel, thus any other of the present proposed major airport developments. Action being in the Los Angeles territory was thoroughly cognizant of the fact that when practically all portions of the Los Angeles metropolitan area are covered by fog, that the San Fernando Valley is clear. Air traffic originating from the L. A. Metropolitan Airport, flying to the north and as far as early as to toward Salt Lake City, will find it necessary to cross the city or thickly populated areas in arriving at these base point.

Waldo D. Waterman, Managing Project

The project at present is under the management of Waldo D. Waterman, veteran pilot and aeronautical engineer. He has laid plans for what promises to be one of the greatest aircraft industrial centers of the country. The proposals are to be leveled, surfaced, and drained where necessary, and an administration building erected and provision made for a radio station and weather bureau in time for completion about October 1, of this year.

By mass production of uniform type or sizes of buildings, the expenses of the project anticipate being able to establish relations with reliable contractors which will materially decrease the unit cost of buildings of given size, and in this way enable those leasing on the field to enjoy a reduced

renting and building cost if they so desire. They are also in a position to be of assistance in helping the financing or erection of permanent buildings on the L. A. Metropolitan Airport.

Pioneer Aircraft School, Inc., Planning To Build Three New Models of Airplane

FIVE STUDENTS have been accepted recently by the Pioneer Aircraft School, Inc., of East Palmdale, S. J., and extensive activities are planned for this season and the future. The program includes the production of three models of new production plane designed by Charles F. Wirt, a member of the corporation and formerly associated with the Goss Flying Circus.

The three models of the new plane are to have the same fuselage and tail surfaces and standardized wings whereby it will be possible to convert an model to any other by an interchange of wings and engines. All models will be built for left-hand rotation.

National Air Transport Expands Large Increase in Volume of Mail at New Rates

C. R. FLEMING, assistant manager of the National Air Transport, Inc., at Kansas City, is making arrangements for a big increase in the amount of mail to be handled when the new rate goes into effect August 1. A survey among Kansas City business men indicates that revenue will be very large and may necessitate additional planes. With new contract routes also due to be in operation out of Kansas City in the next few weeks, the "postoffice" mail will increase.

Col. Lindbergh to Use New Curtiss Falcon In Transcontinental Air Transport Work

THE CURTISS Falcon plane, completed recently by the Curtiss Aeroplane & Motor Co. at Garden City, N. Y., has been purchased by the newly-formed Transcontinental Air Transport, and assigned to Col. Charles A. Lindbergh, head of the Transcontinental Committee, for his personal use.

The new plane is exceptionally fast, having a top speed of just over 350 m.p.h. and a cruising speed of 235 m.p.h. The Falcon is powered with a R-15 by Curtiss "Casper" white metal, V-16 type engine, of the same type which was used on the Curtiss "Brewer" and "Wheeler" planes which won the greatest and most dangerous plane races last fall at Spokane, at record breaking speeds.

The Falcon airplane is equipped to carry 750 lb. of mail or baggage in its fitted load compartments, forward of the pilot, in the fuselage. The new compartment is also available.



New Curtiss Falcon airplane to Colonel Lindbergh for his T.A.T. duties. Passengers may be carried in a special compartment cabin.

able to a passenger cabin, being equipped with two comfortable folding seats, sliding glass windows, adjustable ventilators and a small corner light inside the compartment. The plane can carry 150 gal. of fuel, enough for five hours flying at about 275 m.p.h. cruising speed. It is expected that Colonel Lindbergh will use his new Falcon on his peacetime and other official trips for Transcontinental Air Transport.

American Hammered Piston Ring Co. Book Gives Data on Engines Built Since 1919

A NEW book of piston ring specifications has been published by the American Hammered Piston Ring Co. It is a 72-page book containing instructions for the proper installation of piston rings, gasket ring specifications for Knott engines and piston ring specifications for practically all car, truck, motorcycle, motorcycle, tractor, and marine engines. One of the world's leaders of this new book is the responsibility of tables showing which engines use rings of the same specifications. The data published in the book covers practically all models of engines made since 1918.

Bennett Flying School of Kansas City, Kan., Opens Its Third Branch at Olathe, Mo.

THE BENNETT Flying School, Kansas City, has opened its third school at Olathe, Mo. C. A. Bennett, Jr., is superintendent of the field and school and Bennett Aircraft is an instructor. The school is at a new field three miles in the Berke Field. It has about 160 acres. Two Redhawk planes are being used to start the school. The Bennett organization now has three schools—the Olathe and Kansas City schools and another at Pittsburg, Mo.



**A whirling propeller
...respects no person**

THE man who "knows" airplanes, stays clear of a whirling propeller. Curtiss engineers, however, will cluster about a 'plane being started-up — heedless, in their curiosity and enthusiasm, of the danger of getting too close.

Flying field visitors must be protected against their own thoughtlessness. Accidents undermine public confidence in aviation.

Mark a safety zone with an Anchor Chain Link Wire Fence and restrict visitors to this area. Anchor Fences are available in all heights and types for every need. Everlasting service is insured by the Exclusive Anchor Fasteners: (1) U-Bar Line Posts (2) Square Terminal Posts, (3) Drive-Anchorage, (4) Wire-Weld Girths.

Anchor Nation-wide Fencing Service places fencing specialists and trained creators at your disposal. Phone or write the nearest Anchor District Office for complete information.

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UNITS 100-100000
HIGH SPEED 120 M.P.H.
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WIDE FOR DELIVERED AIRCRAFT

**THE GATES-DAY
AIRCRAFT CORP.
PATTERSON, N.J.**

for
**Air Mail
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Instructing
Heavy Hauling
The Family
Sport
Pleasure
Hard Service
Economy
Big Profits**

Mass Flight to be Held Aug. 16 in San Diego To Commemorate Wright's First Take Off

RAN EDEGBO, Calif., will be the scene on August 16 of a mass flight in which 300 planes are expected to participate. These will be drawn from the Army, Navy, and Marine Corps and probably will represent all types of planes in use by these forces. It will be the greatest number of aircraft ever sent aloft simultaneously. The Navy is expected to send up 160 planes, under command of Rear Adm. A. M. Bowers. The Army will be represented by 140 planes from March, Grady, Kelly, and Rockwell Fields. Fifteen Marine Corps planes will go up for the Marine Corps.

This flight will commemorate the 25th anniversary of the Wright brothers' first successful take-off in a heavier-than-air machine, will assist in dedication of San Diego's new airport and attract the attention of the nation to San Diego.

Notables to be Present

Among those reported to have signaled their intention of being in San Diego are: Herbert Hoover, Col. Charles Lindbergh, the secretaries for aviation in the Departments of War, Navy, and Commerce; Maj. Gen. James K. Eastel, chief of the Army Air Corps; Harry E. Guggenbush; Dwight F. Davis, secretary of war; Anthony H. G. Francher; Glenn Martin; Glenn Curtiss; and Will Rogers.

Visitors will witness a simulated attack against the city by five squadrons of planes, trying of a 3,000 ft. smoke screen completely obscuring the city; exhibition of torpedo and bomb dropping; simulated flights off the decks of the aircraft carriers Langley, Lexington, and Lexington; air combat; dropping mailbombs from a Martin bomber with parachute; dedication of a 20,000,000 mailbomber between and two miles of stretch on the ground, ready for inspection.

Twenty-four Officers Graduated June 30

From Army Air Corps School at Langley Field TWENTY-FOUR OFFICERS, two of them from foreign countries, and the remainder from various branches of the Army and Marine Corps, were graduated from the Army Air Corps Tactical School at Langley Field, Hampton, Va., June 30 at exercises over which Maj. Gen. James E. Foshel, chief of the Air Corps, presided.

The graduates were: Major Frank M. Anderson, George H. Brett, Ray S. Brown, John F. Carey, Jackson W. Jones, Arnold E. Kringstad, Kenneth H. C. Richards, Martin F. Scobee, and Robert L. Walby; Capt. Richard H. Richard, Willis H. Rich, Robert E. Gilroy, and Lawrence F. Shaw, all of the Air Corps; Maj. Francis T. Brown, Capt. Francis F. McBride, and Capt. James E. Davis, of the Marine Corps; Capt. William W. Wan, Command Warlike Services, Capt. Thomas H. Phillips, Chief Artillery Corps; Maj. Charles R. Cunningham, Corps of Engineers; Maj. George B. Aronson, Field Artillery; Capt. Stuart Cutler, Infantry; Capt. Raymond C. Stahl, Engineers; and Maj. George Madden, Ordnance Army; and Lieut. Eduardo Renteria, Argentine Navy.

Curtiss Organization to Open Southern

Branch of School at Miami Next December GLENN H. CURTISS has announced the opening of the southern branch of the Curtiss Flying School at Miami to take place in December and operate each winter session till May. The 160 per cent flying schools in the Miami district during the winter and spring months of the North was the aim of the division in one of its school schools. Plans for enrollment of students and selection of instructors are getting under way in Garden City, the G. H. C. of the Curtiss organization.

James Rinchart in American Eagle Plane Makes Endurance Record for OX-5 Engine

A WORLD'S record of 32 hr. 35 min. and 35.1 sec. for sustained flight of a plane powered with a 50 hp. Curtiss OX-5 engine was made by James Rinchart, 39 yr. old Portland, Ore., at Seaside, Ore., on June 28. The flight was made in the pilot's American Eagle biplane. The craft is official. Lieut. Valerius Geydard, of Soviet Russia, secretary of the National Aeronautics Association, and representative of the Fédération Aéronautique Internationale, represented and checked time on the flight.

The plane was filled with auxiliary tanks bringing the total fuel supply carried to 240 gal. Rinchart took off at 4:57 A.M. The load was about 800 lb. and he took off with the head with a run of only about 1200 ft. A light wind helped him at the take off but the remainder of the day the air was very calm—perfect flying weather. The reason for this was the plane down at 9:16 P.M. and had 18 gal. of gasoline left. The engine was running perfectly but Rinchart did not want to risk landing after dark for fear of engine trouble in the large crowd that had gathered on the beach.

This is the first official endurance record in the OX-5 class. One sustained record was made by a 26 Thrust that was stayed in the air 32 hr. and 35 min. by refueling aloft. Jimmy's father, Dr. Curtis Rinchart, Portland physician, was at the beach to watch the flight. Young Rinchart is head of the Columbia Gulf Airways Co. which operates from a Portland seaplane base.

Monarch Aircraft Co. of Riverside, Ill., Now Manufacturing Three Place Biplanes

THE MONARCH three place biplane, manufactured by the Monarch Aircraft Co. of Riverside, Ill., is a light commercial biplane of conventional type powered with a 60 hp. Curtiss OX-6 engine or six power plant up to 100 hp. In design the plane possesses safety features that are the guarantee of the Department of Commerce and all parts have been approved by Aeronautics, Inc.

As in many of the new production planes the Monarch has a welded steel fuselage and wood wings. The landing gear is of the split hydraulic type, each axle independently of the other, the spring and oil mechanism working inside the tubes that form the axles.

The plane has a wing span of 32 ft. on the upper wing and 20½ ft. on the lower wing. Each wing has a chord of 5 ft. 2 in. and the maximum of 21½ deg. The overall length of the plane is 22½ ft. and the overall height 9½ ft. The weight empty is 1200 lb. and the useful load 600 lb. In performance tests the plane attains a high speed of 100 m.p.h. and has a landing speed of 35 m.p.h.

Both passenger and pilot seats are beautifully upholstered and an Elgin Unit Control is mounted in front of the pilot. The landing gear has a capacity of 50 gal. The wings are braced by 5 struts and struts and wires.

H. S. Lowe of Kansas City Becomes District Sales Manager for American Eagle Corp.

H. S. LOWE, for the last 3½ yrs. distributor of Auburn automobiles at Kansas City, has sold his business to the Auburn factory and will become district sales manager of the American Eagle Aircraft Corp. at Kansas City, with headquarters in Chicago. Mr. Lowe will look after the American Eagle company's interests in Illinois, Indiana, Kentucky, Iowa, Minnesota, Michigan, Wisconsin, and Ohio. He will use a plane in his work. Mr. Lowe has been deeply interested in aviation for three years.

Edo Pontoons and the Ryan Brougham



on a beach, upon making collecting and demonstrating more comfortable.

Edo brought about Ryan with strong way easy, and this is an important feature in Seaplane operation. Good maneuvering is secured by large placement of the float, giving more buoyancy of 115%. High location of the wing allows the Seaplane to be brought aloft by any moderately high bow, and it is brought down by "Aldred" and smoothly moved.

the float must operate and cause no sea sick, wind, and allowing the Seaplane to be moved in open and allowing all the credit of longest landing which would make operation.



EDO AIRCRAFT CORPORATION
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STANDARDIZED ALL METAL SEAPLANE FLOATS

THANK YOU for supplying AVIATION

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The trade mark
which symbol-
izes the crafts-
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The Shelton Looms

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THANK YOU for supplying AVIATION

Air Mail Planes of Two Boeing Companies Have Covered 2,563,300 Mi. in One Year

FLYING 3634 mi. daily over 1,827 mi. of air mail routes since July 1, 1934, the Boeing Air Transport, operating since July 1, 1934, and Pacific Air Transport, operating since Sept. 1, 1934, pilot up a total of 2,563,300 mi. in the air, according to reports issued here by W. G. Heron, vice president in charge of traffic for Boeing Air Transport, which now controls Pacific Air Transport.

The Boeing Air Transport route between San Francisco Bay and Chicago is 1818 mi.; Pacific Air Transport, Seattle-Los Angeles route totals 1099 mi. To this date, the two combined routes has carried 1,381 passengers over 854,095 passenger miles; the Coast has carried 1,547 persons over 596,600 passenger miles.

Speed is fast, expense and passenger planes built by the Boeing Airplane Co. of Seattle are now used exclusively on both routes, then standardizing equipment for liability of operation, the report says.

Chasmate of Lindbergh Added to Staff of Parks Air College Flying Instructors

WILLIAM HERVEY of East St. Louis, a former Coastliner Air Service pilot, has been added to the Parks staff as a ground school instructor, and A. A. Tate, a former chasmate of Colonel Lindbergh and Red Lore of Illinois, and Kelly Field, has been added to the flying staff. He is the youngest instructor.

The Parks school now has more than 100 students and 30 instruction planes.

Three Companies to Build New Factories Near Municipal Airport at Wichita, Kan.

THE QUICK Air Motors Co., just organized to convert the old Blount water cooled airplane engine into the improved Quick air cooled radial engine, has let the contract for a new factory building adjacent to the new 340 acre municipal airport at Wichita, Kan. The factory will occupy a 15 acre site. Robert S. Powers, of operating, has been elected president of the company, with C. Eric Quick, well known airplane engineer, vice president. The company will convert 1,400 Blount engines. From 50 to 175 skilled mechanics will be employed.

The Swift Aircraft Co., builder of a two place biplane, also has purchased 12 acres adjoining the airport for its factory purposes. The Red Bull Aircraft Co., now at Wichita, also plans a factory there.

Pacific Air Transport Improves Service From Oakland, Calif., to Points Northwest

IMPROVED AIR and service for Seattle, Portland, and the Pacific Northwest in communication with Oakland, Calif., has been brought about by a special Oakland route made up at Vancouver, Wash. Air mail from North Coast points arrives at Oakland Airport at 1 P.M. and is delivered to the city immediately. Mail from Oakland for North Coast points is also handled in special planes for expedited handling. Northwest air mail to and from Oakland on Pacific Air Transport planes was traded and taken off with San Francisco mail at Oyster Field, and had to be taken across the Bay by ferry boat, creating a some delay.

Bids for Air Mail Lines to Porto Rico and Canal Zone Opened by Post Office Dept.

W. IRVING GLOVER, acting postmaster general, opened bids July 2 for two air mail lines out of New York, the one to the Canal Zone and the other to Porto Rico. Both routes are potential economies for service to South America and each will bring substantial United States into closer touch with its southern and southern possessions.

Two bids, both of \$600 per mile, were received for the Porto Rico route, one being from the West Indian Aerial Express of New York City and the other from the T.W. Anderson Airways, also of New York City. One bid of \$6 per mile was received for the Canal Zone contract from the Pan-American Airways.

The route to the Canal Zone is 1,840 mi. long, while the one to Porto Rico is 1,260 mi. long. The former provides for stops at Havana, Cuba, Mexico, Mexico, Brazil, British Honduras, Venezuela, Republic of Honduras, Nicaragua, Managua, San Jose, Costa Rica, and Colombia; Canal Zone, seven times a week. The Pan-American General, under the contract will assume the right to include Guatemala and Salvador in the route, and also to extend it northwest from the Canal Zone to Colmar, Colombia, Maricao, Venezuela, Caracas, D. W. L. La Guaira, Venezuela, Port of Spain, Trinidad, Georgetown, British Guiana, and Paramaribo, Dutch Guiana, and way three times a week.

The Porto Rico route, as laid out, runs from Key West to Havana, San Juan, Cienfuegos, and Santiago, Cuba, Puerto-Rico, Brazil, Santa Domingo, Dominican Republic, Rio San Juan, Porto Rico, with service each way three times a week. Service on this route may be extended at the option of the Post Office Department from San Juan, Porto Rico, by the Leeward and Windward Islands, to Port of Spain, Trinidad, three times a week.

Recent Survey of Florida Airways Shows Twenty-Six Cities to Have Landing Fields

TWENTY-SIX FLORIDA cities have airplane landing facilities of varying, somewhat, or no facilities type, according to a recent survey announced by A. H. Horner, city aviation director. There are 22 cities with municipal airports. They are Gainesville, Fort Myers, Hialeah, Jacksonville, Lakeland, Miami, St. Petersburg, Sebring, Stuart, Tallahassee, Tampa, and Titusville.

Other large commercial airports are International, Jacksonville, Miami, Ocala, Oronochee, Orlando, Sanford, Tampa, and West Palm Beach. Auxiliary fields are at Arcadia, Avon Park, Bartow, North Lakeland, Pensacola, St. Augustine, Silver Springs, and Gulf Breeze, Jacksonville, Naval Air Station, Key West, and the Naval Air Station, Pensacola. Cities listed as proposed the construction of airports are Bradenton, Dunedin, Fort Pierce, Ocala, Ocala, Lake Wales, Fort Myers, Miami, Miami, Miami, Ocala, Orlando, Palm Beach, Pineport Park, Sebring, Titusville, Yee Beach and Winter Haven.

First Travel Air Plane Built 3 Years Ago Has Been in Constant Service in St. Louis

O. E. SCOTT, manager of Lambert Field, St. Louis, accompanied by Harry M. Kunkel, one of the original Lindbergh helpers, visited the Kansas City airport recently. They were from the first Travel Air plane built in the Wichita factory in 1932. The plane has been in constant use in St. Louis since it was first made and the only "original" is a disk on the fuselage.



Touch the Button to Start Your Motor

In your ship on in your car, motor starting is entirely automatic.

Heywood Starter Equipment produces positive instant starting by simply touching button conveniently located in pilot's cockpit.

Absolute starting reliability regardless of weather conditions or temperature is the result of sound engineering perfected by careful research and practical construction. Highly engineered an optional equipment by leading aircraft manufacturers.

Complete details of the Heywood High Pressure ignition starter on request.

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This beacon is now described as standard for the airports installed by the Department of Commerce.

When you Light your Airport

the first piece of equipment should be a G-E 24-inch beacon. A majority of the beacons already installed by the Government on American airways are of General Electric manufacture.

Ask the aviation lighting specialist at the nearest G-E sales office for complete information covering the superior construction and operation of this beacon.



GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y. SALES OFFICES IN PRINCIPAL CITIES

to carry a useful load of 7,000 lb. It is designed for a safety factor of five with a gross load of 13,000 lb. Although the plane only stayed in the air 36 to 34 sec. and 20 sec. to break the endurance record in order to have a load capacity which would keep it in the air for 70 hr. The speed of the machine is reported to be high but no exact figures are available. The main fuselage plane was fitted with a motor not having a output of 500 hp. Observations were made from a large window in the center of the wing just back of the pilot's cabin.

Increasing the Output to Decrease Costs

Continued from page 178

portance of the fuselage, then the dope department where it will ramped up with the fuselage, and into the main assembly room where the plane will be completely assembled and pushed out onto the new runways field.

"This is what is called light assembling such as is used in the Ford plant and there will be no loss of transportation or back loss. These methods should decrease the labor cost of the present methods between ten and fifteen per cent. This, of course, will require a factory nearly built and especially constructed for work of this kind, with no vibration in other agency.

"During a production of the future of the airplane industry as the past experience of successful automobile concerns, standardized models will be developed and continuously improved with possibly no more than two models in two dif-

ferent prices being put out by one manufacturer. Sales of fact and advertising will probably have no big a significance in reducing costs by increasing volume as any other single factor. In other words, I think we have good planes and good pilots, but the first airplane company that establishes a real selling campaign and a real dealer organization, who are not building good model planes which the public demand will be, will be the most successful and outstanding aviation company in the United States."

It is essential to even the casual observer that aviation will require great selling effort so to advertising and publicity. Foundation for this has been made by the numerous facts in 1927 which are producing more attention from the public to aviation than probably any other industry has shown. Aviation is new, it is transportation, transportation is time and time is money. This appeals to all of us alike. The trouble with aviation, as some aviation executives see it, has been that said industry it has attracted very few of the older experienced business and financial men to its cause. It has been represented by the aviation pilot, who, while a good flier, has had relatively little experience as a business man. Probably no business success could have occurred for aviation's lack of financial and business management which has been prevalent in the industry.

Aviation manufacturers are coming to realize that the actual experience needed in employees for quality of production of airplanes is to be gained by doing, not making, by building and engineering, not driving.

In building up the airplane production organization the new standard that as the first vital step they would concentrate on production, improving the design constantly rather than changing radically. As soon as the organization was running smoothly two planes a week were manufactured.

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This then permitted development of planes for new types, new models and new equipment.

Looking toward the future from the Massachusetts Institute of Technology, in collaboration with the sales and engineering department but not a production program for the factory that is just now becoming efficient to a point where the organization can visualize the results. The Evans Division is divided into two main sections. These are, in order, everything and when the 20 finally reach the assembly department, only two things are needed to complete the plane and make it ready to fly—fuel and labor.

Each one of the 18 units is complete within itself. However, for the sake of speed in production the main wing sections are subordinated and the subordinated parts are divided into single pieces. Many more in the factory concentrate on the single parts for the sake of efficiency and economy in their production.

To follow quickly a plane through the factory. The other department after a conference with the factory decides how many planes will be sold during a 30 day period. (It must be understood that the factory is naturally already in production on a schedule at some 10 days previous.) As soon as the new material reaches the shop room, parts production orders are issued by the production manager. The material is called for by the different departments and made in batches. The complete parts are sent back to the stock room and reworked. And when the time comes for delivery, these parts are taken to the shop, assembled, tested in a completed plane and then sent for shipment or flown away.

Maximum Cordex Stock Record

The factory office organization maintains a complete record, stock record with perpetual inventory of new material. For reasons of speed, three other forms are used by the office. All parts ordered from the production department are made out in pink form. These pink record cards contain a complete story of material and labor on each part and a final statement in blue ink on the perpetual inventory.

When for individual parts are completed, unit production orders, containing 20 to 30 or 14 units, at which drawings are issued on yellow forms. These units are then back up from the respective parts and returned to stock.

Blue forms indicate final assembly. A blue form is issued with its other duplicate on each drawing unit and these are of considerable importance to the production and sales departments for they fill a complete story—how much material, how much labor, how much the drawings cost as a unit to build and so forth.

The original production order calls for a complete material list and is made out in triplicate. The last piece in the factory apparatus which is new sends orders to the department heads. The second goes to the stock room and the third to the main shipping or production records. No travel down by the department forms is allowed after the storehouse copy. This is a very simple and efficient production procedure and the heads of the company have at their finger tips exact information at the time to the accuracy of taking for a Douglas to go through production, and how far along it has progressed.

In the building department the entire work is done on gage with the widest working in years. With the low and work are installed very similar to the way an ordinary house is wired and the men can work on any part of the shop without moving the large gas bottles.

The paint department is run in a similar manner. All of the work is big air gun spray and air brush. After the factory is completed by the welding department, it goes immediately to the paint department where it is painted under pressure to the entire exterior of the steel tubing. A

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900 ft. from the ground. As the cross roads were very strong, Lieutenant Wright flew over the hangar to where Lieutenant Dean to be carried to the field before landing. Little did the pilot realize that his proper mental condition such a risk of allowing himself to drop half way to the ground before getting the rope. Especially as it was his first jump. However, "tick" is Lieutenant Dean's middle name and he naturally thought several things when he missed the rope and saw which were before him. He landed safely near the Administration Building.

Another parachute drop followed the first one. This one was by Roy L. Allen. He was also piloted by Wright. As he missed the field, Allen was later saying one of his friends to him, the name of which, I must confess, I do not know, Allen is a new member of the L. & H. Aircraft Co. He was recently signed up as a pilot for the company. He has more than 3,000 hrs. of flying time in his credit and he is well thought of in that flying, having done much of this sort before the advent of modern pattern airplanes. Although he was to complete in the 10th run across the Pacific Ocean, Allen was unable to do so because of the lateness in the completion of his plane.

A Commercial license was given to Theodore White after his jump. White, who is only about 15 yrs. old, is said to be the youngest parachute jumper in the East. In one year he has completed about 36 jumps. He has recently passed the L. & H. Aircraft Co. and is a graduate of the North School of Aviation. Allen piloted the plane from which White jumped.

Stanford Field attended the first solo flight of William O'Connor, a Yale student. He completed his course of instruction with an instructor of the L. & H. Aircraft Co. He is given his student license. A student license was also given to James Leeson.

Savannah, Ga.

Actual construction of the Savannah, Ga., municipal airport will be started July 15, it is announced by John E. Stewart, chairman of the airport committee. The land to be situated for this purpose includes 825 acres. One of the features of the landing field will be a 2,500 ft. runway, which compares favorably with any in the country. It is expected the job will be completed and be turned over to a state in August. Plans for a clubhouse to be held in connection with the opening of the field will be made soon, it is understood.

Construction of the southern terminal facilities for an air line which is projected somewhere in the United States with all of Central America and the West Indies will begin at Miami in a few weeks, it is announced by Capt. J. K. Wheeler, in charge of survey and construction for the Trans-American Airways, Inc. He said he would complete his work in Miami in two weeks. As soon as the Miami terminal facilities are completed, Miami-Havana service will be started. The company already operates between New York and Havana.

From Miami the survey staff will go to Southwestern Colombia where a field is under consideration for the high-altitude point across the Yucatan channel to the first Central American stop, Santa Marta, Yucatan. Other proposed stops are Belen, Macadamia, Puerto Bermeo, Guatiquila, Medellin, Manizales, Neiva, San Jose, Costa Rica, Panama, Pinar, Panama, Colon, Panama, and Porto Bolivar, Panama, where connections will be made with the German Sudia line operating in Colombia to Ecuador and Venezuela.

A feeder line out of Havana through the West Indies is projected. Plans will be for a line to include Miami to Cuba.



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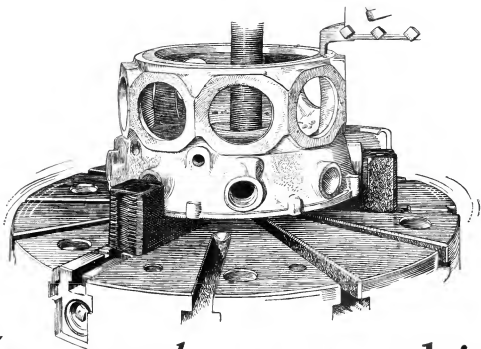
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Two weeks go by before a crankcase casting is fully machined ready to be assembled in an engine. Two weeks—time not necessary for machining alone but time which Wright machinists know should be allowed for readjustment of the metal between successive operations. These men know their metal—know its peculiarities of stress and strain—its tendency to warp and

run out of shape under the heat generated by cutting tools. Each man knows how much heat the part he makes will stand before expanding—knows how much heat each cut involves—knows when to stop before warping begins. He will machine one part; then jump to another. He knows when a casting needs a "rest", and sets it aside for two days, or even three, before machining again.

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